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THE SCHOOL OF ENGINEERING

## THE MECHELECIV

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## ● A CONCRETE SOUL

In the past year we have noticed repeatedly stories in the local newspapers relating the arguments put forth by various groups proposing or opposing changes in local streets. In each of several cases District highway engineers sought to have antiquated or badly worn streets resurfaced with modern asphalt, and in each case the engineers were accused of being without souls, having no interest in beauty, or failing to realize the importance of quaintness.

Certainly we can all agree that an engineer should attempt to make the very best use possible of natural beauty when he is planning the development of a highway, street or bridge. Washington is a city in which natural beauty has been preserved far more than in any other city of equal age. At the same time, as memorials and structures have risen, every effort has been made to match the new structures to the old in a manner that would enhance the beauty of the city.

While this plan has been followed, Washington has grown to almost double its previous population in the last 15 years. Automobile traffic has increased at a colossal rate, until Washington undoubtedly now has some of the most heavily traveled streets and bridges in the world. The problem of making the smooth flow of vehicular traffic possible on streets and bridges which retain all of their original quaintness and beauty is staggering. There have been some very serious accidents as a result of poor paving, such as the bus accident on the Memorial Bridge several years ago.

This has now become a clear problem for the engi-

neer. He must make his decision between beauty, artistry, and quaintness on the one hand, and safety, traffic flow, and practicality on the other. If it is necessary for an engineer to appear to have a concrete soul in order to achieve the major objectives, then let him so appear. By the very nature of his profession he has offered himself to the public as a servant to safeguard their interests and build in a manner which will provide them with comfort and safety, regardless of cost to himself.

As engineers, we should be prepared to stand forth strongly now in a determined effort to have M Street repaved with asphalt instead of the old and badly worn cobblestones in Georgetown. If Georgetown loses two pounds of its ancient quaintness by this move, the motoring public will gain one hundred pounds of comfort and safety, and a permanent improvement will have been made.

With our present degree of engineering training, we should be prepared to make an immediate decision in favor of replacing the paving stone on the Memorial Bridge with asphalt paving. We may instantly be accused of being without artistic balance, but the people whose lives will be saved through the avoidance of accidents, particularly in winter, are not going to be as bitter about engineers when they report in for final roll call.

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## ENGINEERING SCHOOL CALENDAR

November 1950

November 1—Wednesday—ASCE, ASME, IRE and AIEE meet in Hall of Government, 8:15 p.m.

November 3, 4—Friday and Saturday—AIEE Middle Eastern District meeting.

November 8—Wednesday—Sigma Tau Meets.

November 15—Wednesday—Theta Tau Meets, D-201.

November 22—Wednesday—Sigma Tau Meets.

November 29—Wednesday—Theta Tau Meets, D-201.

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### About our Cover

Motor frames at the Lima, Ohio, Small Motor Division plant of the Westinghouse Electric Corporation are carried from the point of fabrication to the point of use on an overhead conveyor. When they reach the proper point, they are removed and tumble into waiting receptacles—all automatically.

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# Pressure Measurement

by Edward L. McGandy

*Undergraduate Bachelor of Science in Engineering*

The success of scientific research in general, or of any particular project, is often dependent on the skill of the investigator in devising apparatus for the accurate measurement of the desired properties. Indeed, the development of such apparatus often constitutes a full-fledged research project in itself.

Of all properties attributable to matter, none has encountered such a wide variety of measurement devices over such a wide range of values as that property which we call pressure. The first and most obvious methods of measuring pressure constituted the substitution or opposition of the same property which could be standardized and measured in another substance. Pressure at the bottom of a column of a fluid such as mercury or water varies directly with the height and might be opposed by the pressure in the substance being measured.

Such methods are immediately found to be impracticable for measurement of five times atmospheric pressure or higher. As for the lower pressures, a fairly accurate measurement may be obtained down to one-one hundredth of atmospheric pressure. This use of the column of liquid is very often in an instrument called a "manometer". At high pressures, the cumbersome size of the manometer, as well as other

more detailed considerations, limits the measurement, while at low pressures, it is the volatility of the liquid combined with surface effects. At first it might seem that this range of pressures would be sufficient to carry on research. To realize that this is not the case, we have merely to consider the common radio tube and the internal combustion engine in your car.

For the measurement of such low pressures as exist in light bulbs and many types of electronic tubes, a much more sensitive gauge is necessary. It must employ an entirely different principle than the opposition of a pressure with another pressure. In this field of measurement a new device has been developed by the Westinghouse Research Laboratories of Pittsburgh, Pennsylvania. Called an "ion gauge," the new instrument can detect the presence of air in a vacuum where only one air molecule remains out of every 10,000 billion originally present. The mean free path of molecules at this pressure is some 5000 miles. This is the distance that a molecule of the gas would travel in a vast expanse of the same gas at the same pressure before striking another molecule. While scientists have gone this far in their quest for a perfect vacuum, until now it has defied measurement. To give some idea of the problems encountered in such research, the glass used to contain such vacuums must be carefully selected in order to employ only that type which has a very low vapor pressure. Otherwise molecules of glass evaporating from the solid would obscure the measurement.

The new gauge was developed by 29-year-old Robert T. Bayard, under the supervision of Dr. Daniel Alpert, head of the inter-atomic physics section of the Westinghouse Research Laboratories. According to Dr. Alpert, this new instrument could prove the key to unlock the door to many new fields of investigation. To study the behavior of very small numbers of molecules, it is necessary to remove practically all of the air molecules originally present in the experimental system. Now that it is possible to achieve and measure such ultra-low pressures, experiments can be carried out which have hitherto been impossible because the particular molecules under study would get lost among the relatively larger number of air molecules. For example, a better understanding of how gases seep through metals should follow as the result of this new instrument.

To measure the pressure in a vacuum, the gauge is sealed tight to the system. Then the power is turned on, and electrons from a 'gun' inside the gauge are released, just as in a radio tube.

*(Continued on page 15)*



*New electronic pressure gauge in use at the Westinghouse Research Laboratories.*

# Measurement of Moisture

by **Christos L. Maskaleris**

1950 Graduate in Electrical Engineering

The application of electronics to the textile industry again can be applied to the measurement of the moisture content of cloth emerging from a textile dryer. The apparatus used is called the Fielden Drimeter and is able to obtain accuracy within two percent irrespective of the speed at which the cloth or material moves through the meter. The readings are not affected by the dyes, salts, size or other finishing materials used in the cloth. The instrument was originally developed in England, and is now being introduced here by the Fielden Electronics Company, a concern located in Long Island, New York.

This instrument takes the place of the sense of touch method and the manufacturer claims the new method has increased, on an average, the production output of the drying process by twenty-five percent. In addition, by drying the cloth to the normal moisture content the manufacturer is able to save on his fuel and power, and thus decrease operating expenses and at the same time turn out a better product. So far, eight hundred installations of this machine have been made and it has been reported from one user that he was able to increase production sufficiently in the first months of its use to cover the cost of the instrument and installation.

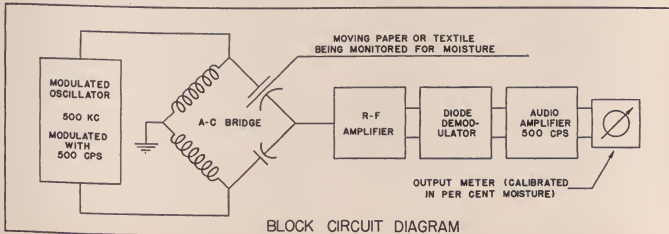
The operation of this instrument is dependent upon the detection of minute changes of the electrical capacitance of a two plate condenser through which the cloth specimen passes. Capacitance changes as small as 0.001 of a micro-micro-farad are readily detected. The greater the percentage of moisture in the fabric the greater is the capacitance, since the cloth acts as the dielectric of the condenser. The latter is true because the specific capacitance of water is high in relation to that of cellulose and animal fibers. This apparatus presents no operation hazard to the operator by virtue of the potential difference between the plates of the exposed condenser since a

Pd of only 0.1 volt at 500 cps is applied.

The instrument employs a special drift free bridge circuit and an amplifier having sufficient stability to permit furnishing the meter with standard pre-calibrated percentage-moisture scales. The scales used on meters read from 0 to 20% moisture content for use with cotton, viscose, jute, and linen; for wool the scales are calibrated from 0 to 40%. If conditions should vary beyond these ranges, an auxiliary meter can easily be switched in.

Adjustment for operation merely involves running the machine dead-slow for a few minutes (or using a dry sample between electrodes) so that out-turn is definitely dry, and adjusting a knob on the instrument panel until the indicator points to DRY on the scale. An accessory calibration unit permits resetting without use of dry samples, as is desirable during constant processing of short runs of various standard materials.

This moisture measuring instrument can be coupled to an accessory automatic control unit, currently available, which in turn controls the speed-changing mechanism of the drying machine. Two variables are fed into the automatic control—a voltage varying with moisture content, derived from the Drimeter, and a voltage varying with the drying machine speed, i.e., the speed with which the material being dried passes through the drying ovens, is obtained from a small alternator belted to this drying machine. With these two incoming voltages the automatic controlling mechanism applies a speed correction proportional to deviation from desired moisture content. The higher the speed of the drying machine, the more frequent are the corrections in speed. If the machine stops, or if the yarn or fabric runs out, the control becomes inactive. Another feature of this tester is that humidity has no effect on the accuracy, since 100% humidity is small compared to  $\frac{1}{2}\%$  moisture in the fabric.





# Magnetic Fluids

by Michael Saba

1950 Graduate in Electrical Engineering

A recent development of the National Bureau of Standards known as Magnetic Fluid, which was originally used in the Electromagnetic Fluid Clutch, has several interesting and unique features. Further studies of the properties of these mixtures have revealed that magnetic fluids can be employed to good advantage in hydraulic systems, shock absorbers, and dashpots, to form casting molds, and as variable electrical resistors. The basic property on which all these applications depend is that the viscosity of a magnetic fluid is directly related to the strength of the applied magnetic field—the fluid may be changed from a liquid to a nearly solid state and back again at will.

One engineering application proposed in the Bureau's preliminary investigation of new uses for magnetic fluids is the magnetic fluid dashpot. Basically, a dashpot consists of a piston moving in a fluid-filled cylinder with the viscosity of the fluid resisting the piston motion. In a conventional dashpot, the rate of travel of the piston is determined by the external force, the fluid pressure on the piston, the dimensions of the fluid escape vent, and the fluid viscosity. The variable usually controlled is the pressure on the piston. The rate of piston travel can be adjusted mechanically by providing a variable orifice in the piston or in the cylinder wall—a method that presents a number of complications. On the other hand, if a magnetic fluid were used in the dashpot, the rate of motion of the plunger could be controlled readily by magnetically varying the viscosity of the fluid. If a coil of wire is placed around the dashpot, the viscosity of the magnetic fluid will be a function of the current in the coil. Employing this idea in the design of shock absorbers for automobiles and trucks would provide an adjustable riding quality to meet various loading and roadway conditions. The rate of response of the magnetic fluid is high enough to provide virtually instantaneous changes in viscosity, thereby making possible a shock absorber with automatic compensation.

The electromagnetically controllable fluid offers interesting possibilities for use in hydraulic systems. If the hydraulic system is filled with a magnetic fluid, valving becomes extremely simple. By winding a coil of wire around a fluid-carrying pipe and controlling the amount of current through the coil, the flow of fluid past that point can be closely regulated from full flow to complete cut-off. An obvious advantage of this scheme is that various points in a hydraulic system can be remotely controlled from a central station.

This next application is really unique—electromag-

netic fluids also are being investigated for use in molding operations. A fluid is placed in a pot surrounded by a current-carrying coil, a model of the part to be cast is placed in the fluid, and the coil then is energized so that the fluid will solidify around the model. When the model is removed, a detailed impression remains outlined in the solidified magnetic fluid. Molding compound then can be poured into the mold and allowed to harden. After the coil current is turned off, the molded replica easily can be removed from the liquid. In any application of this kind, the boiling point of the magnetic fluid must be higher, of course, than the temperature of the molten casting material.

Another application of this fluid is as an electrical resistor adapted for remote control by immersing two electrodes in a magnetic fluid. When the fluid is in an unmagnetized condition, the resistance between the electrodes will be extremely high because of the very loose contact among the conductive iron particles that are distributed randomly in the non-conductive oil. In the presence of a magnetic field, however, the iron particles apparently form chains along the lines of magnetic flux and draw into close physical contact. The flux density will determine the massiveness of the chain and, thus, the conductivity of the mixture. When the system is de-energized, the conductance does not drop back to its former very low level. This property of magnetic fluid resistors is attributable to the "Coherer Effect," which has been studied in the past by such well-known investigators as Branley and Marconi.

The fluid clutch seems to be the most practical use for this fluid which consists of a finely divided iron which is mixed with oil to prevent packing and to provide smoother operation of the clutch. Preliminary results indicate that the electromagnetic fluid clutch has numerous advantages over many other existing types. It has extreme smoothness of action because all contacting surfaces, both of the plates and of the iron powder, are coated by a lubricant. The clutch is easy to control and requires very small amounts of electric power. The control is extremely smooth from the minimum, which is determined by the viscous drag of the oil, to the maximum, which is controlled by the magnetic saturation of the iron. Because it has no axially moving parts, the clutch is very easy to build, consisting essentially of a driving and a driven member which do not change relative position, except in rotation. A large clutch, six inches in diameter, using five watts of exciting power, can transmit approximately 40 horsepower at 3,000 rpm.

# The Registration Act For Engineers

We have attempted to obtain final information on the procedure to be followed under this act, but no information is as yet available. We are reprinting the act in full in order that our readers may inform themselves on the main provisions.—Ed. Note.

[PUBLIC LAW 780—81ST CONGRESS]  
[CHAPTER 933—2D SESSION]  
[S. 3535]

## An Act

Defining and regulating the practice of the profession of engineering and creating a Board of Registration for Professional Engineers in the District of Columbia.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.—This Act shall be known and may be cited as the "Professional Engineers' Registration Act".

SECTION 2. DEFINITIONS.—As used in this Act—

(a) The term "practice of engineering" shall mean the performance of any professional service or creative work requiring engineering education, training and experience, and the application of special knowledge of the mathematical, physical, and engineering sciences to such professional services or creative work as consultation, investigation, evaluation, planning, design, and supervision of construction for the purpose of assuring compliance with specifications and design, in connection with the utilization of the forces, energies, and materials of nature in the development, production, and functioning of engineering processes, apparatus, machines, equipment, facilities, structures, works or utilities, or any combination or aggregations thereof employed in or devoted to public or private enterprise or uses. The term "practice of engineering" comprehends the practice of those branches of engineering, the pursuit of any of which affects the safety of life, health or property, or the public welfare. Said practice includes the doing of such architectural work as is incidental to the practice of engineering.

(b) The term "professional engineer" shall mean a person who, by reason of his special knowledge of the mathematical and physical sciences and the principles and methods of engineering analysis and design, customarily acquired by a prolonged course of specialized intellectual instruction and study and practical experience, is qualified to engage in the practice of engineering as attested by his certificate of registration as a professional engineer.

(c) The term "engineer-in-training" shall mean a candidate for registration as a professional engineer who has been granted a certificate as an engineer-in-training after successfully passing the first stage of the prescribed examination in fundamental engineering subjects, and who, upon completion of the requisite years of training and experience in engineering under the supervision of a professional engineer or similarly qualified engineer and satisfactorily to the Board, shall be eligible for the second stage of the prescribed examination for registration as a professional engineer.

(d) The term "responsible charge" shall mean such a degree of competence and accountability gained by education, training, and experience in engineering of a grade and character sufficient to qualify an individual to engage personally and independently in and be entrusted with the work involved in the practice of engineering.

(e) The term "institution" shall mean a school, college, university, department of a university, or other educational institution granting baccalaureate degrees in engineering, reputable, and in good standing in accordance with the rules prescribed by the Board.

(f) The term "Board" shall mean the District of Columbia Board of Registration for Professional Engineers.

(g) The term "Commissioners" shall mean the Board of Commissioners of Engineering.

SEC. 3. PRACTICE OF ENGINEERING DECLARED TO BE SUBJECT TO REGULATION.—In order to safeguard life, health, and property and promote the public welfare, the practice of engineering in the District of Columbia is hereby declared to be subject to regulation in the public interest. It is further declared to be a matter of public interest and concern that the profession of engineering merit and receive the confidence of the public and that only qualified persons be permitted to engage in the practice of engineering. All provisions of this Act relating to the practice of engineering shall be construed in accordance with this declaration of policy.

SEC. 4. PRACTICE OF ENGINEERING WITHOUT REGISTRATION PROHIBITED.—Any person engaged in or offering to engage in the practice of engineering in the District of Columbia shall submit evidence that he is qualified to practice and shall be registered as hereinafter provided; and it shall be unlawful for any person to engage or offer to engage in the practice of engineering in the District of Columbia, or by verbal claim, sign, advertisement, letterhead, card, or in any other way, represent himself to be a

professional engineer, or through the use of the title including the word "engineer" or words of like import, or any other title, imply that he is a professional engineer, unless such person is registered under the provisions of this Act.

SEC. 5. BOARD OF REGISTRATION; APPOINTMENT OF MEMBERS; QUALIFICATIONS; TERMS; REMOVAL OF MEMBERS.—There is hereby created the District of Columbia Board of Registration for Professional Engineers, whose duty it shall be to administer the provisions of this Act. The Board shall consist of five members who shall be appointed by the Commissioners. Each appointment to the first Board shall be from a list of three eligibles submitted by the representative organizations of the engineering profession in the District of Columbia. A person to be eligible for appointment to the Board shall be a citizen of the United States, shall have been engaged in the practice of engineering for twelve or more years, of which at least five years shall have been in responsible charge of important engineering work, and at the time of appointment shall have been actively engaged in the practice of engineering in the District of Columbia for a period of at least five years next preceding this appointment. The Board shall at all times include one representative for each of the chemical, civil, electrical, and mechanical branches of engineering. The members of the first Board shall be appointed within three months after the effective date of this Act to serve for the following terms: One member for one year, one member for two years, one member for three years, one member for four years, and one member for five years from the date of their appointment, or until their successors are duly appointed and qualified. Each member of the Board shall receive a certificate of his appointment from the Commissioners, and before beginning his term of office shall file with the Secretary of the Board of Commissioners his written oath for the faithful discharge of his official duty. Each member of the Board first appointed hereunder shall be registered as a professional engineer under this Act. On the expiration of the term of any member of the Board, the Commissioners shall appoint for a term of five years a professional engineer to take the place of the member whose term on said Board is about to expire. Each member shall hold office until the expiration of the term for which such member is appointed or until he has been duly reappointed and shall have no right to be requalified. The Commissioners may remove any member of the Board for incompetency, misconduct, neglect of duty, or for any sufficient cause. An appointment to fill an unexpired term on the Board shall be made within three months after the vacancy occurs, and shall be for the period of such unexpired term.

SEC. 6. COMPENSATION OF MEMBERS OF BOARD.—Each member of the Board shall be entitled to receive such reasonable compensation for his services as may be determined by the Commissioners not to exceed \$25 per day for each day he may be actually engaged upon business pertaining to his official duties as such Board member.

SEC. 7. BOARD MEETINGS AND ORGANIZATIONS.—The Board shall hold a meeting within ten days after its members are first appointed and thereafter shall hold at least two regular meetings each year. The Board shall elect annually from its members as least the following officers: A Chairman and a secretary-treasurer. A quorum of the Board shall consist of not less than three members, and no action shall be taken without three members in accord.

SEC. 8. GENERAL POWERS OF BOARD.—The Board shall have power:

(a) APPROVAL OF INSTITUTIONS.—To investigate and to approve those institutions that provide and maintain satisfactory standards for the education of students desiring to engage in the practice of engineering.

(b) REGISTRATION OF PROFESSIONAL ENGINEERS.—To register as a professional engineer any person of good character and repute who is a citizen of the United States, at least twenty-five years of age, and who speaks and writes the English language, if such person—

(1) holds a license or certificate of registration to engage in the practice of engineering issued to him by proper authority of a State or Territory of the United States in which the requirements and qualifications for obtaining such license or certificate of registration are reasonably equivalent, in the opinion of the Board to the standards set forth in this Act. A person may be registered under this subdivision without examination; or

(2) holds a certificate of qualification issued by the National Bureau of Engineering Registration of the National Council of State Boards of Engineering Examiners: Provided,

however, That the requirements and qualifications of said body for obtaining such certificate are reasonably equivalent to those in the opinion of the Board, to the standards set forth in this Act. A person may be registered under the provisions of this subdivision without examination; or

(3) has had four or more years' experience in engineering work of a grade or character satisfactory to the Board, and indicating that he is qualified to assume responsible charge of the work involved in the practice of engineering and either holds a certificate as an engineer-in-training issued to him by the Board or by proper authority of a State or Territory in which the requirements and qualifications of said bodies for obtaining such certificate are reasonably equivalent, in the opinion of the Board, to the standards set forth in this Act, or is a graduate in engineering from an institution having a course in engineering of four or more years, and who, in either event, successfully passes a written, or written and oral, examination prescribed by the Board of engineering subjects. In the case of the examination of an engineer-in-training, his examination shall be directed and limited to those matters which will test the applicant's ability to apply the principles of engineering to the actual practice of engineering. In the case of an applicant who is not an engineer-in-training, the examination shall be for the purpose of testing the applicant's knowledge of fundamental engineering subjects, including mathematics and the physical sciences, and those matters which will test the applicant's ability to apply the principles of engineering to the actual practice of engineering; or

(4) has completed an approved secondary-school course of study or equivalent and has had twelve or more years of combined education and experience in engineering of a grade and character satisfactory to the Board and indicating that he is qualified to assume responsible charge of the work involved in the practice of engineering, and who successfully passes a written, or written and oral, examination prescribed by the Board for the purpose of testing the applicant's knowledge of fundamental engineering subjects, including mathematics and the physical sciences, and those matters which will test the applicant's ability to apply the principles of engineering to the actual practice of engineering; or

(5) submits evidence that he is an engineer of established and recognized standing in the engineering profession and that he has been lawfully engaged in the practice of engineering for twelve or more years, of which at least five years shall have been in responsible charge of important engineering work of a grade and character satisfactory to the Board. A person may be registered under this subdivision without examination; or

(6) Submits evidence that he was a resident of the District of Columbia, or that he was engaged in the practice of engineering in the District of Columbia, prior to the date this Act was approved and for one year immediately preceding the date of his application and submits evidence of experience in engineering, of a grade and character satisfactory to the Board, indicating that he is qualified to assume responsible charge of the work involved in the practice of engineering. Registration shall not be granted under the provisions of this subdivision unless the application therefor is filed with the Board within one year after the date of enactment of this Act. A person may be registered under this subdivision without examination.

The requirement of this subsection of residence or practice of engineering in the District of Columbia for one year immediately preceding the date of application shall not be applied to applicants who were on active duty in the armed forces of the United States during such year and who entered on such duty after October 16, 1940, but any such applicant for license under this subsection must have been a resident or engaged in the practice of engineering in the District of Columbia for at least one year prior to the effective date of this Act.

(c) **CERTIFICATION OF ENGINEERS-IN-TRAINING.**—To provide for and to regulate the certification and to certify as an engineer-in-training any person of good character and repute who is a citizen of the United States, at least twenty-one years of age or has graduated from an institution, and who speaks and writes the English language, if such person—

(1) is a graduate in engineering from an institution having a course in engineering of four or more years and who successfully passes a written, or written and oral, examination prescribed by the Board for the purpose of testing the applicant's knowledge of fundamental engineering subjects, including mathematics and the physical sciences. A person may be certified as an engineer-in-training under this subdivision without a written, or written and oral, examination: *Provided, however,* That the application therefor is filed with the Board within one year after the enactment of this Act; or

(2) has completed an approved secondary-school course of study or equivalent and has had eight or more years of

combined education, training, and experience in engineering, of a grade and character satisfactory to the Board, and who successfully passes a written, or written and oral, examination prescribed by the Board for the purpose of testing the applicant's knowledge of fundamental engineering subjects, including mathematics and the physical sciences.

(d) **REGISTRATION OF NONCITIZEN PROFESSIONAL ENGINEERS.**—

To register as a professional engineer any person who is not a citizen of the United States, who is of good character and repute, at least twenty-five years of age, and speaks and writes the English language, if such person submits evidence, of a grade and character satisfactory to the Board, that he is an engineer of established and recognized standing in the profession of engineering in his own country, and who submits certification as to character and qualifications from at least two professional engineers of the District of Columbia. Such registration shall entitle the holder to engage in the practice of engineering only for the duration of and in connection with a specific project for which it was granted, and shall be subject to annual renewal and to suspension or revocation as registration granted as otherwise provided in this Act. Engineers to whom such temporary registration has been granted shall be separately listed in the roster.

(e) **APPLICATION FORMS.**—To require all candidates for registration as professional engineers to file with the secretary-treasurer of the Board a written application on a prescribed form and accompanied by the required fee. Such application shall contain statements made under oath, showing the applicant's education, detailed summary of his experience in engineering work, and the general field or fields of engineering in which he has his principal activity, and shall contain not less than five references, of whom three or more shall be engineers having personal knowledge of his engineering training and experience.

(f) **INVESTIGATION OF APPLICATIONS; DETERMINATION OF QUALIFICATION AND COMPETENCY OF APPLICANTS.**—To investigate the allegations contained in any application for registration as a professional engineer in order to determine the truth of such allegations, and to determine the competency of any person applying for a registration to assume responsible charge of the work involved in the practice of engineering, such competency to be determined by the grade and character of the engineering work actually performed. Any person having the necessary qualifications prescribed in this Act to entitle him to registration or certification shall be eligible therefor, although he may not be practicing his profession at the time of making his application. Evaluation of experience in engineering shall be based upon the applicant's knowledge of the fundamental engineering subjects, which shall be broad in scope and of a nature to develop upon the applicant's engineering knowledge and judgment. In considering the qualifications of an applicant who has graduated in engineering from an approved institution; each year, but not exceeding two years, of successful postgraduate study in engineering, and each scholastic year, in excess of four, of an approved five- or six-year engineering curriculum, and each year of teaching engineering subjects, in an approved institution may be considered as equivalent to one year of experience in engineering. In considering the qualifications of an applicant who is an undergraduate in engineering, or who has graduated in a curriculum other than engineering, from an approved institution; each equivalent year of approved engineering education, as determined by evaluation by the Board of the educational records submitted, may be considered as equivalent to two years of combined education and experience in engineering. Experience in engineering gained under the supervision of a professional engineer or similarly qualified engineer, and experience in engineering gained subsequent to the attaining of an equivalent of the minimum requirements for certification as an engineer-in-training, of a grade and character satisfactory to the Board, shall be given full credit. In any case when the evidence presented in the application does not appear to the Board conclusive nor warranting the issuance of a certificate of registration or a certificate as an engineer-in-training without examination, the applicant may be required to present further evidence for the consideration of the Board, and may also be required to pass an oral or written examination, or both, as the Board may determine. Whenever the Board determines otherwise than by examination that an applicant has not produced sufficient evidence to show that he is competent to assume responsible charge of the work involved in the practice of engineering, and shall refuse to examine or to register such applicant, it shall set forth in writing its findings and the reasons for its conclusions, and furnish a copy thereof to the applicant.

(g) **EXAMINATIONS.**—To prescribe the scope, manner, time, and place for the examination of applicants for registration as professional engineers, to provide for the conduct of and to conduct such examinations, and to make written reports of such examinations. The prescribed examinations shall be written, or written and oral, and designed to permit an applicant for registration as a professional engineer to take the examination in two



stages. The first stage of the examination shall be designed to test the applicant's knowledge of fundamental engineering subjects, including mathematics, physical and applied sciences, properties of materials, and the principles of engineering design. Satisfactory passing of this portion of the examination shall constitute a credit for the life of the applicant or until he is registered as a professional engineer. The second stage of the examination shall be designed to test the applicant's ability to apply the principles of engineering to the actual practice of engineering in the field of engineering in which he has indicated his principal activity. An applicant failing to pass an examination may apply for reexamination at the expiration of six months and will be reexamined upon payment of the prescribed fee.

(h) **CERTIFICATE OF REGISTRATION; FORM AND EXECUTION; EXPIRATION; DUPLICATE CERTIFICATE; BIENNIAL RENEWAL OF REGISTRATION; RENEWAL FEE; PENALTY FOR DELAYED RENEWAL.**—To issue a certificate of registration and a pocket registration card to each professional engineer granted registration under the provisions of this Act. The certificate of registration shall authorize the registrant to practice as a professional engineer, show the full name of the registrant, have a serial number, and be signed by the members of the Board under the seal of the Board. The pocket registration card issued with the certificate shall show the full name and registration number of the registrant, state that the person named therein has been granted registration to practice as a professional engineer for the period ending on the 31st day of October in the second year of the then current biennial registration renewal period, and be signed by the Chairman and secretary-treasurer of the Board; to provide for and regulate the renewal of registration of professional engineers registered under this Act. On or before the 1st day of August 1952, and biennially thereafter, the secretary-treasurer of the Board shall mail to every professional engineer registered under this Act a blank application for biennial renewal of registration, addressing such application to the last known post-office address. Upon receipt of such application blank, a registrant shall execute and return the application for his biennial registration renewal card to the Board together with the biennial registration renewal fee of \$2. Upon receipt of such application and renewal fee the Board shall issue a pocket registration renewal card which shall show the full name and registration number of the registrant, be signed by the Chairman and secretary-treasurer of the Board, and state that the person named therein has been granted registration to practice as a professional engineer for the period beginning November 1 in the year of issue and expiring on the 31st day of October in the second year following. Application shall be made biennially on or before the 1st day of November and if not so made an additional fee of \$1 for each thirty days delay beyond the 1st day of November, and up to the 1st day of March following shall be added to the current biennial registration renewal fee to be paid upon renewal; to issue a duplicate certificate of registration to replace a certificate lost, destroyed, or mutilated, subject to the rules of the Board, and upon payment of the prescribed fee. The issuance of a certificate of registration by the Board shall be presumptive evidence in all courts and places that the person named therein is entitled to all the rights and privileges of a registered professional engineer while said certificate remains unsuspended, unrevoked, or unexpired.

(i) **CERTIFICATE OF REGISTRATION TO A NONCITIZEN; FORM AND EXECUTION; EXPIRATION; RENEWAL OF REGISTRATION; RENEWAL FEE.**—To issue a special certificate of registration and pocket registration card to every noncitizen professional engineer granted registration under the provisions of this Act. The special certificate of registration shall authorize the registrant to practice as a professional engineer in connection with a specific project, show the full name of the registrant, have a registration number, and be signed by the members of the Board under the seal of the Board. The special pocket registration card issued with such certificate shall show the full name and registration number of the registrant, state that the person named therein has been granted temporary registration to practice as a professional engineer, state the specific project in connection with which the special registration is granted, the period for which it is granted, not to exceed one year from the date of issue, and be signed by the Chairman and secretary-treasurer of the Board. Temporary registration may be renewed at the discretion of the Board for periods not in excess of one year upon application therefor and payment of the annual renewal fee.

(j) **CERTIFICATE AS ENGINEER-IN-TRAINING.**—To prescribe and to issue a certificate, attested by its seal and signed by the members of the Board, to any applicant who in the opinion of the Board has satisfactorily met all the requirements of this Act for certification as an engineer-in-training.

(k) **ROSTER OF REGISTRANTS.**—To keep a roster of all professional engineers registered under this Act, showing the registrant's name, place of business or employment, registration number, and the general field or fields of engineering in which

registrant qualified to practice, and a roster of engineers-in-training certified under this Act. These rosters, together with other information deemed to be of interest to the engineering profession, shall be published in booklet form by the Board on the 1st day of March of each even year, beginning with 1952, or as soon thereafter as practicable. The Board shall also, upon the 1st day of March of each odd year, beginning with 1953, or as soon thereafter as practicable, publish a supplemental roster of all registered professional engineers and certified engineers-in-training. Such published rosters shall contain at the beginning thereof the words: "Each professional engineer receiving this roster is requested to report to the Board the names and addresses of any persons known to be engaged in the practice of engineering in the District of Columbia whose names do not appear in this roster. The names of persons giving such information shall not be divulged." Copies of these rosters shall be mailed or otherwise sent to each registered professional engineer and engineer-in-training and be furnished to other persons upon request.

(l) **OFFICIAL SEAL; MINUTES AND RECORDS.**—To adopt and have an official seal, and to keep minutes and records of all its transactions and proceedings, and a complete record of the credentials of each applicant and registrant. A transcript of any entry in such minutes and records certified by the secretary-treasurer under the seal of the Board, shall be prima facie evidence of the original entry in such minutes and records.

(m) **MEMBER OF NATIONAL COUNCIL OF STATE BOARDS OF ENGINEERING EXAMINERS; DUES.**—To become a member of the National Council of State Boards of Engineering Examiners and to pay such dues as said council shall establish, and to send a delegate to the annual meeting of said council and to defray his reasonable and necessary expenses.

(n) **ADMINISTRATIVE RULES AND REGULATIONS; EMPLOYEES.**—To adopt, amend, rescind, promulgate, and enforce such administrative rules and regulations not inconsistent with this Act, as are deemed necessary and proper by the Board to carry into effect the powers conferred by this Act. To employ such clerical or other assistants as are necessary for the proper performance of its duties. To regular annual employees of the Board shall, for the purpose of laws relating to compensation, classification, retirement, and leave, be employees of the District of Columbia. The Board may at its discretion fix and change from time to time, without reference to the Classification Act of 1949, the compensation of employees of the Board employed on a temporary or part-time basis.

(o) **ENFORCEMENT OF LAWS; INVESTIGATION; ATTENDANCE OF WITNESSES; PRODUCTION OF BOOKS AND PAPERS; SUBPENA PROCEDURE; WITNESS FEES.**—To enforce the provisions of this Act, to investigate for unauthorized and unlawful practice, to employ such persons as it may deem necessary to assist in the investigations and prosecutions incident to enforcement, to require the attendance of witnesses and the production of books and papers, and to require such witnesses to testify as to any and all matters within its jurisdiction. The Chairman and secretary-treasurer of the Board shall have power to issue subpoenas, and each shall have authority to administer oaths. Upon the failure of any person to attend as a witness, when duly subpoenaed, or to produce documents when duly directed by said Board, the Board shall have power to refer the said matter to any justice of the United States District Court for the District of Columbia, who may order the attendance of such witnesses, or the production of such documents, or require the said witness to testify, as the case may be, and upon the failure of the witness to attend, to testify, or to produce such documents, as the case may be, such witness may be punished for contempt of court as for failure to obey a subpoena issued or to testify in a case pending before said court. Witnesses who have been subpoenaed by the Board, and who testify if called upon, shall be paid the same fees that are paid witnesses in the United States District Court for the District of Columbia.

(p) **REFUSAL, SUSPENSION, AND REVOCATION OF CERTIFICATES.**—To refuse to issue a certificate to any person, or to suspend or revoke the certificate of registration of any professional engineer or the certification of any engineer-in-training issued hereunder if such person—

- (1) has been convicted of a felony;
- (2) has been found guilty of deceit, misrepresentation, violation of contract, fraud, or gross incompetency, in his practice;
- (3) has been found guilty of fraud or deceit in obtaining his registration or certification;
- (4) has aided or abetted any person in the violation of any provision of this Act;
- (5) has violated any provision of this Act;
- (6) has been declared insane by a court of competent jurisdiction.

(Continued on page 17)

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# ALUMNEWS

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It is interesting to note that *Frank J. Davidson*, BME 50, is now employed at Pepco's Buzzard Point plant. Many of you may remember the fine article on this plant which appeared in the November, 1949, issue of *Mecheleciv*. Frank is quite a proponent of the idea that the budding engineer should make sure that he gets some practical experience in his field before he graduates, even if it means night classes and delayed graduation. He thinks it really pays big dividends in the end.

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*Rudy Volin*, BME 50, ex-sparkplug of the ASME, is working for McGregor and Werner, Inc., as a junior engineer doing technical writing, and worrying, like many others, about the menacing arm of Uncle Sam.

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*Joe Widman*, BME 50, is still with the Navy Bureau of Ordnance in the Gun Design Section, where he was recently joined by *Edwin Stengard*, BME 48, who apparently can't stay away from good old D.C.—Stengard has been in Minneapolis for two years.

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*Frank Thompson*, BME 50, who was reported in our last issue as a Plumbing Inspector in Arlington County, has a new job at the Patent Office, and is now attending Law School at night. Also in Law School is *Nick Chacos*, BME 50. His effort to stay off the unemployed list, is a position as a surveyor in the office of *Lindsey Construction Co.*—they do reinforced concrete work.

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*John C. Goff*, BME 46, continues as an instructor in ME drawing courses at G. W., and also with his day job at NOL. It seems that Professor Goff has been a victim of a terrible error on the part of the *Mecheleciv* last year. In our reporting of the last ASME Convention we reported every field trip of the convention except the NOL trip; you guessed it, the one run by none other than John C. Goff, the only G. W. alumnus to conduct a trip in the convention. Apologies are extended, Professor, and we promise to be more careful in the future.

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The ubiquitous *Jimmy Sinsabaugh*, BME 49, is in the Turbines and Gears Section of the Navy's Bureau of Ships. Jimmy is Recording Secretary of the Engineering Alumni Association, and says to keep your eyes on the Association as it is going to get hot and do something this Fall. Lets hope Jimmy is right about this.

Since he left the Central Radio Propagation Laboratory at the Bureau of Standards to take a position in the Sound Division of the Naval Research Lab, *Matt Flato*, BEE 49, has been prying Cadillac convertibles—probably searching for a way to spend his newly raised salary as a P-2. For more news of Matt's grade raises, read in same time same place next year when Matt is again eligible for a raise. His friends are sure he will be pricing Rolls Royces by then. Among those Matt is leaving at the Bureau of Standards are *Lee Smith*, BEE 49, and *Bob Doud*, BEE 49.

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*Norman Miller*, BME 49, at Naval Ordnance Lab in the Evaluation Division, is anxious to get in touch with *Merrill Brown's* Theta Tau alumni crowd. Two other BME 49 men out at the Naval Ordnance Lab in the same section are *Bob Koche* and *John Quill*.

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The stork whispers that he has a package awaiting spring delivery to the *Kenneth Browns*, BEE 49. Meanwhile *Imogene* (Missus B.) is working out at the Naval Research Laboratory.

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*Claude* (Tiger) *Dimmette*, BCE 50, ex-*Mecheleciv* Ed., Theta Tau, etc., now with *Thos. G. Oyster Co.*, surveyors, in Wheaton, Md., was seen sporting a new auto—Chevy—at the Engineers' mixer. Tiger is still not married but has been seen frequently with the intended, *Elise Shields*.

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Speaking of the mixer, quite a few alumni crawled out of their retirement to partake of Mr. Heurich's generosity, namely, *Floyd Jennings*, BCE 50, *Dick Koester*, BCE 50, *John Connor*, BEE 50, *Howard Grayson*, BEE 50, *Al Craft*, BEE 50, *Bill Whittemore*, BEE 50, *Wally Kistler*, BME 50, "Dutch" *Besier*, BCE 50, and *Kenny Brown*, BEE 49. Wally tells us that he is quitting the Gas Company to go with the Bureau of Ships in a two year engineering indoctrination course which is expected to lead to a red hot job.

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*Merwyn K. (Pop) McKnight*, BS in ME 38, BEE 41, was also at the mixer apologizing to several CE's for his failure to procure a CE degree to round out his collection.

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Of course many alums were at the V.P.I. slaughter—nice, wasn't it? Not passed over in the survey were big *John McPhail*, BEE 50, and his momentary support, *Kenny Brown*.

# ENGINEERING PERSONALITIES

## UNDERGRADUATE



Although a part time student, John Lewis is another of those individuals who manage a high Q.P.I. and still participate actively in many extra-curricular activities.

Born in Whitehall, Wisconsin, on January 31, 1929, Johnny spent the early part of his life as a farm boy until he moved to Seat Pleasant in 1939 where he attended Lyndon Hill Junior High School.

After his family moved to St. Louis, John attended and graduated from high school there and immediately went to work in the advertising division of the Coca-Cola Bottling Company. Returning to D. C. in January 1946, John enrolled in the Winter Term at the George Washington University, and began to pursue his career as a Civil Engineering student. His professional associations began when he joined the student branch of the American Society of Civil Engineers at the University in 1947, and his second activity here came when he was invited to pledge Theta Tau, the professional engineering fraternity, in the following year. During the summer of 193 Lewis worked as a junior engineer in the Hydraulics Division of the Bureau of Standards and enjoyed his work to such an extent that he has chosen this field for specialization after he graduates from the University.

John's scholastic achievement was recognized by an invitation to pledge Sigma Tau, honorary engineering fraternity, and shortly thereafter he was elected to the Engineers' Council as the Theta Tau delegate. He served as office chairman for the Council in addition to his general duties. In the early part of 1949 John assisted the Engineering School representative on the Inaugural Float Committee in the construction of the float. His first office in Theta Tau was the position of treasurer, to which he was elected in January of 1950. In April of the same year, he was elected Regent. Early last summer John accepted a position with CECO Steel Company as a detail draftsman and has retained his position there, returning to George Washington this fall as a part time student.

## ALUMNUS



The story of Haaren A. Miklofsky begins in Rochester, New York, on November 25, 1920. He has been a "George Washington" student since the beginning of his high school days, having spent the regulation four years at George Washington High School in Rochester.

Miklofsky early decided that above everything else, he wanted a good education. Financial difficulties postponed his entering college, so Miklofsky wangled permission from high

school authorities to take typing and shorthand at East High School, a school not in his district, and here he spent the next year, going both day and night. At this point circumstances appeared to permit his entering the University of Buffalo, and the fall of 1938 found him entering Buffalo as a freshman. Financial difficulties forced his withdrawal before completion of the first semester, but Miklofsky, still undaunted, continued his education by going back to East High School. He also canvassed the local architects, and was able to find one who would teach him architecture in return for secretarial work. 1941 found him coming to Washington in the Civil Service, and he soon was doing drafting for the Bureau of Standards.

Miklofsky soon heard that George Washington University offered night classes, and he hastened to enroll, choosing the Civil Engineering curriculum as the nearest thing to architecture. His grades early showed his superior ability, and he was tapped by Phi Eta Sigma, freshman honorary.

In early 1944, Miklofsky began to feel the hot breath of the draft at his heels, and he applied for a scholarship, hoping to attend school full time and complete as much of his education as possible. He was awarded the Emma K. Carr scholarship, and began full time that spring, working part time at the Bureau.

The University offered no courses in the summer of 1944, so Miklofsky and five others bowed to the inevitable and joined the Navy. After basic training, a real piece of luck sent him here to the Naval Research Laboratory for duty. He arrived in time to register late for the winter term at GW. He continued in school until the summer of 1946, finding time to borrow a trumpet and play in the band, work on the Mecheleicv staff, join Theta Tau and Sigma Tau, and collect the Theta Tau award for the best scholastic average.

Miklofsky began inquiring about graduate work in 1945, and chose Yale University, since it was here the legendary Professor Hardy Cross taught, and Professor Walther had recommended that Miklofsky choose the teacher rather than the school. Professor Cross wrote in April, 1946, that one vacancy remained out of fourteen, and Miklofsky could have it. This letter found Miklofsky still in the Navy and with twelve semester-hours remaining to be taken. He accepted anyway, and set about finding a solution to his quandary. First he got a 36-hour leave and took a train to Cornell, the only school offering the twelve hours he needed. He managed to find the proper people in Ithaca, arrange to take the courses, and get back to Washington just under the 36-hour deadline. The Navy released Miklofsky as a second class radio technician in June, and he was off to Cornell.

Summer passed quickly at Cornell, and Miklofsky arrived in New Haven with his BCE degree on the day classes began. Housing shortages gave Miklofsky the opportunity to live with Dean Dudley of the Engineering School. The people of Yale proved friendly, and his election to Gamma Alpha, the graduate scientific fraternity, soon followed.

After completion of the winter's work, Miklofsky  
(Continued on page 16)

## AIEE HOST TO DISTRICT

The local chapter of the AIEE will soon be host to a meeting of the Student Counselors and Student Branch chairmen of the Middle Eastern District of the Society (District No. 2). The two-day conference will begin on Friday, November 3rd, as the delegates arrive in town. Final arrangements to accommodate the visitors have been made by Jerome S. Antel, chairman of the second district's Student Activities Committee. Virgil Harris, chapter secretary, will attend to the details of registration.

Delegates will register in Lisner Auditorium on Friday morning from nine until ten. After this, they will break up into separate conferences, which are scheduled to last for an additional hour. The main feature of the first day's program is the trip to the Bureau of Standards. There will be just enough time for the visitors to eat their lunch at the Bureau's cafeteria before they begin the inspection tour. After having spent the balance of the afternoon taking in the various laboratories on the grounds, the visitors will attend a Banquet at the "400" Restaurant. The featured speaker on this occasion, Dr. Eugene Crittenden, is the Senior Associate Director of NBS.

The following day the delegates will have the opportunity to see the Maryland-George Washington football game at Byrd Stadium, since the schedule leaves that time free. The morning, however, will be taken up by more meetings and conferences, and will terminate with the closing session at eleven.

Those interested in the conference and desiring further details of the schedule may see Virgil Harris, or call him at ME 7748.

## KAYE JOINS ENGINEERING STAFF

The latest addition to the Mechanical Engineering staff is Assistant Professor John Kaye, who comes to us from the California Institute of Technology, where he was engaged in research work at the hydrodynamics laboratory. He is a graduate of CalTech with a B.S.M.E. 1939 and an M.S.M.E. in 1948.

Upon graduation from CalTech, Mr. Kaye went to Ingersoll Rand as a student engineer in their training program. After completing his training course, he was employed as design engineer at Hughes Aircraft Company, where he worked on wing structure design and armament.

During the war years, Mr. Kaye worked with the War Production Board, in the aircraft branch of materials requirements, for the aircraft program. Later he went to Lima, Peru, with the Pan American-Grace Airline as a liaison engineer and instructor. He is a member of A.S.M.E. and of Sigma Xi, a graduate fraternity of science research.

Mr. Kaye's teaching assignments at George Washington include four of the senior engineering subjects; machine design, air conditioning, fluid dynamics, and proseminar in mechanical engineering. His approach to his subject and his methods of teaching have evoked some favorable comments among his students. Many feel that the material is not so cut and dried as previously and that he makes his subject more palatable.

Other teaching experience Mr. Kaye has had includes effective speech and human relations. He is also interested in psychology and industrial management. Mrs. Kaye is also a teacher. Besides their regular teaching duties, Mr. and Mrs. Kaye are presently engaged in house hunting.

## ENGINEERS HOLD MIXER

The Christian Heurich "Hospitality Hall" was the scene of the successful annual Engineers' Mixer on October 4, 1950, as some three hundred engineering students, faculty, alumni, and friends gathered to inaugurate the fall engineering activities. "This is the most successful Mixer yet," stated Dean Feiker, "and the Heurich Hospitality Hall is a good place to have it."

Al Moe, vice president of the Engineers' Council and master of ceremonies for the evening, introduced the representatives of the various engineering fraternities, societies, and activities. Each speaker explained the purposes and aims of his organization and briefly outlined the program planned for the school year.


Ed Compagna, the "Maniac Magician" who doubles as an engineer-student at G. W., entertained the gathering with his amusing execution of magic tricks and specialties.

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## SOCIETIES AND FRATERNITIES



- The story of Theta Tau fraternity begins 46 years ago at the University of Minnesota, when on the 15th of October, 1904, the constitution of the fraternity was accepted and the first chapter was officially installed. In the 46 years, that have followed, additional chapters sprang up at the more noteworthy engineering colleges throughout the United States.

Gamma Beta Chapter of Theta Tau was officially installed at the George Washington University on March 16, 1936. The first member of Gamma Beta chapter and the present Grand Regent of the Fraternity (nationally) is Professor Norman B. Ames, better known to the engineers as "Deacon" Ames. Since that first initiation, 264 young men, all engineers, have signed our roll book.

Theta Tau is a national professional engineering fraternity of college students. In other words, it is a fraternity which has chapters on many campuses throughout the country, and whose membership is derived from men of one common profession, that of engineering. For this reason, the members of Theta Tau are united with a double bond; the first is a professional bond which develops while obtaining an engineering education, and the second is a strong fraternal bond which develops through membership. The results are apparent when old alumni faithfully show up at chapter functions year after year. Since Theta Tau is not a social organization, it does not compete with the social fraternities on the campus and dual membership is a normal occurrence.

Membership in Theta Tau is by invitation only. A prospective member's name is submitted to the chapter by one of the active members, and the prospect is then judged on the basis of character, personality, integrity, wisdom, and fidelity to his chosen profession. One of the best ways in which a student can prove that he is qualified on the above points is by active participation in Engineering School extra-curricular activities, with special emphasis on the professional societies. Furthermore, it is in activities such as these that a student can meet active members of Theta Tau, so that his name can be proposed.

On October 21, Gamma Beta was strengthened by the addition of seven new men, who were initiated on that day. The new members are Edmund Bailor, Waldo German, Harold Gersten, Keith Hord, Richard Julius, Robert Spitzer, and Edward Younger. These men were selected last spring and served a one semester pledgeship during which time they learned pertinent information about the fraternity, assembled a skit given during the intermission at their initiation dance, and constructed a wooden model of the fraternity badge. During the dance, a prize of a metal slide rule was presented to Waldo German for the very fine badge he constructed of black walnut. All of the models were excellent and indicated fine workmanship and ability.

On November 11, Theta Tau will hold its annual Oyster Roast, at which the actives challenge the alumni to a rip-roaring game of touch football, which marks all those who participate for at least a week because of limps, bruises, or sprained and sore muscles. Brother Bob Cashman will provide the feature attraction again this year, when he cooks up a big kettle of red hot shrimp, at which he is uncontested champion in the fraternity. A large turnout of both actives and alumni are expected at this affair, which is always one of Theta Tau's big moments of the year.



- The Student Branch of the American Society of Mechanical Engineers will hold its first meeting of this school year on Wednesday, November 1 at 8:15 p.m. in Government 101. The program for the meeting includes two speakers and football films. Mr. Gene Vacca,

Chairman of the Washington area chapter of ASME, and Mr. Harry Harwood, chairman of student activities for this area, will be the speakers. The football films will be of last year's GW games. Dues for members of ASME are \$3.00 for the coming year and with this membership you receive eight issues of the Mechanical Engineering magazine.

As in past years, the parent society of ASME will hold a smoker this year which members of the chapter may attend by paying a nominal fee. This affair is "just for a good time" and to assure this, professional entertainment will be presented. This is a very opportune time to meet senior engineers in your field and talk with them in a relaxed atmosphere. The affair is usually given early in November; for exact time and place and for tickets see any of your ASME officers.

Chapter officers for this year are: Prof. R. G. Trumbull, Honorary chairman; Frank Yeide, chairman; James Petrolino, vice chairman; Richard Keister, secretary; James Binkley, treasurer; Bob Curtis and Hugh Bauer, Engineers' Council representatives.



- Biennially the Sigma Tau Fraternity, national engineering honor society, holds a conclave of delegates from its twenty-five chapters in engineering schools throughout the country. This year it was held at Lawrence, Kansas, from the 19th to the 21st of October. A lively

program was arranged which kept everyone really busy. The National Council of Sigma Tau gave its report, which was followed by reports from the various chapters. The election of the National Council by the conclave then followed the business meetings. The educational program included field trips to local laboratories. Just to make sure that the program did not get too dry, a smoker was held on Friday night, and the climax of this year's conclave was the banquet which was held Saturday night. By Sunday afternoon, most of the delegates had reluctantly departed, and another conclave had become history. The delegate from Xi chapter, Chester Bilinski, left on Wednesday the 16th by train for the gathering, and returned Monday night the 23rd.

The last meeting of the Xi chapter here at GW was held the 18th of October. Being the first meeting of this school year, it was devoted mostly to reorganization, such as the appointment of committees to perform various functions for the ensuing year. Arthur Bailey, Jr., who presided in the absence of Chester



Bilinski, reminded the members that one of the big-gest tasks in the semester ahead will be the selection of the new pledge list. Pledges must be scholastically in the upper third in the School of Engineering and of the junior or senior classes. Practicality and sociability are also factors to be taken into account for the selection.

This year's officers were elected shortly before the pledging of the second, or spring class, last year. A few of them are Chester Bilinski, president; Arthur D. Bailey, Jr., vice president; Willis Vary and Joe Rekas, Engineers' Council Representatives; and Prof. B. C. Cruickshanks, chapter advisor.



- The Student Branch of the American Institute of Electrical Engineers at George Washington University will hold its first meeting of this school year on Wednesday night, November 1, at 8:15 p.m. This meeting, which will be held in conjunction with the Institute of

Radio Engineers, will be mainly for organization and for the introduction of freshmen and new members to those other members whom they have not previously met. It is very important for engineers, who work so closely in their profession, to develop a spirit of brotherhood, and there is no better place for it than at these meetings.

A step in this direction is the annual division conference of AIEE student chapters of the Mid-eastern District engineering schools. The chapters are represented by their counselors and student chairmen. Last year the conference was held at the University of Akron, Akron, Ohio. It was attended by Professor Jerry S. Antel, AIEE faculty advisor; Chairman J. F. McPhail, Secretary R. J. Kiernan, and R. W. Zens. This year, GW's chapter of AIEE is the host. The meeting is to be held the 3rd and 4th of November. The program, with all the details, will be made available to those interested. All AIEE's are urged to attend.



- On Wednesday, November 1, the George Washington University chapter of the Institute of Radio Engineers will hold its first meeting of this year. This will be a joint meeting with the American Institute of Electrical Engineers. Plans have not been made for speakers

or films as is customary, for it is felt that the first meeting should be devoted to organization. Committees will be formed to undertake the responsibilities and perform the work so necessary in making this year a most successful one educationally, and just as important, socially. Do not be alarmed when you read that committees will be formed and decide not to attend, for we sincerely trust that if some do not join our organization the many that do will make it possible to distribute the work to those who have the time and opportunity to perform what little is asked of them. You cannot deny that the more that pitch in to help, the easier it is for all and the better a job is done.

Officers of IRE for the current year are Fred Battle, Chairman; Clair Kennedy, Vice Chairman, Herman Norwood, Treasurer; Willis Vary, Secretary; Paul Meissner and Robert Spitler, Engineers' Council representatives.



- On Wednesday, November first, the Student Branch of the American Society of Civil Engineers will hold its first meeting for the current school year in Room 202, Hall of Government, at 8:15 p.m. Those men desiring to join the Society who have not already done so may

sign up at the meeting, and all undergraduates in Civil Engineering and Bachelor of Science curricula are eligible.

Mr. H. G. Hunter, Assistant Commissioner of the Public Buildings Administration will be the first guest speaker for this year. Mr. Hunter worked as an advisor in Russia in connection with engineering following the first World War. His talk to the Student Branch is to be on "Engineering in Russia, and Engineering Opportunities Overseas," and should provide the students with an excellent opportunity to get accurate information at first hand on this matter.

Plans for the program of the ASCE will be discussed during the business meeting, which precedes the informal talks. Those desiring to join will become eligible for participation in the competitions for various prizes, including the best paper award from the Chapter, in a junior and senior group, the Washington Engineering Club competition, and the Lincoln Arc Welding Foundation competition.

Additional information is available from any officer of the Chapter. Chapter officers for the current year include H. B. Crummett, President, Oscar Hokanson, Vice President, Dick Caldwell, Treasurer and Dino Karayianis, Secretary.

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When these electrons collide with air molecules in their path, they knock off part of the molecule to create a positively charged particle called an ion. The number of ions formed in this way each second is an accurate measure of the pressure inside the vacuum system. It can be simply read from a meter attached to the system. Previous ion gauges were limited in their sensitivity because of false readings produced by x-rays inside the gauge, which has been eliminated in this gauge. Comparing this method again with the mercury manometer, such pressures would raise the level of the mercury only one-thousandth of a billionth of an inch, whereas atmospheric pressure would raise it 30 inches.

In the field of high pressure measurement, the extremely high pressures achieved far exceed any accurate method of measurement known today. The very highest pressures are in what is known as the "super-pressure region." Steel, one of the less compressible materials, is reduced to one-half of its original volume by these pressures, and all fluids become solid, regardless of their original melting points. The crystalline nature of matter is preserved, but greatly altered to accommodate the sharply reduced interatomic spacings. Even the hardest solids can be molded like putty.

These phenomena have been demonstrated experi-

mentally with pressures as high as one hundred thousand times that of the atmosphere. Measurement of such pressures is approximate, since it must be estimated by the weights applied to cause it, and inaccuracies are introduced due to the effects on the compressing apparatus itself.

At pressures somewhat less than a quarter of this highest pressure, another method of measurement offers itself. It has been found that a coil of manganin wire, subjected to compression, changes appreciably in resistance. The resistance of a given coil may be calibrated to give the pressure of an enclosed system without relying on the accuracy of any mechanical apparatus. One type of resistance pressure gauge, developed and used extensively by the Baldwin Locomotive Company, is applicable with great accuracy up to a pressure of two thousand atmospheres. This gauge was found to be superior with respect to reproducibility of results to the Bourdon tube gauge, which depended on the deformation of a short length of curved tubing connected to the system.

Whether the property is pressure, length, temperature, time, or mass, the method of measurement requires ingenuity and a knowledge of scientific principles with which the investigator is not primarily concerned. It is the function of such investigators to acquaint themselves with related subjects, overlooking any predisposition to confine their interests to an extremely narrow field of science.

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(Continued from page 11)

agreed to teach at George Washington for the summer. At the end of the Summer Sessions, he had to journey up to New Haven for his oral examination. There was hardly enough time for him to return before the Winter Term began. The same type of hectic round trip had to be made in May of '48 for the comprehensives. This part of the grind over, Miklofsky was able to begin work on his thesis.

Miklofsky had begun to spend some time on errands of a purely social nature in New York City. It was here that he met Rita B. Nelson, the girl who was, in March of 1949, to become his wife. This and his coming to George Washington in September of the same year, as Assistant Professor, caused the postponement of the completion of his thesis until June of this year. The work of writing the final draft of the thesis continued through the school year of 1949-50. Many of Miklofsky's students helped in proof reading, and Edward Simonetti helped with some of the calculations.

Dr. Miklofsky was awarded his PhD degree at Yale in the latter part of June of this year. One of his burning ambitions is the establishment of a graduate school for engineers at George Washington. The outlook at present for this is encouraging, in view of the proposed new Engineering Building. Possibly, in five years or so, our school may be awarding Masters' Degrees in Engineering.

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(Continued from page 9)

diction and has not thereafter been lawfully declared sane.

(g) **REISSUANCE OF REVOKED CERTIFICATES.**—To reconsider the application of any person whose application has been refused or to reissue a certificate of registration to any professional engineer or a certification to any engineer-in-training whose certificate has been revoked for reasons the Board deems sufficient, upon payment of the prescribed fee for such reissuance.

**SEC. 9. COMPLAINTS; HEARINGS; PROCEEDINGS; APPEALS.**—(a) The Board may upon its own motion, and shall upon the sworn complaint in writing of any person setting forth charges which would constitute grounds for refusal, suspension, or revocation of a certificate, as set forth in section 8 (p) of this Act, investigate the acts of any person holding or claiming to hold a certificate. All charges, unless dismissed by the Board as unfounded or trivial, shall be heard by the Board within three months after the date of which they shall have been filed.

(b) The Board shall, at least thirty days prior to the date set for the hearing, notify the accused in writing of any charges made, and shall afford him an opportunity to be heard in person or by counsel in reference thereto. Such notice may be served by its delivery personally to the accused licensee by the United States marshal in the manner prescribed for service of original process in the United States District Court for the District of Columbia, or by mailing it by registered mail with return receipt demanded, to the place of business last theretofore specified by the accused in his last notification to the Board. At the time and place fixed in the notice, the Board shall proceed to hearing of the charges and both the accused and the complainant shall be accorded ample opportunity to present in person or by counsel, such testimony, evidence, and argument as may be pertinent to the charges or to any defense thereto. The Board may continue such hearings from time to time and shall give notice in writing to all parties in interest of the date and hour to which the hearing has been continued, and the place at which it is to be held.

(c) The Board shall preserve a complete record of all proceedings at the hearing of any case wherein a certificate is refused, revoked, or suspended. The notice of hearing, complaint, and all other documents in the nature of pleadings and written motions filed in the proceedings, the transcript of testimony, and the orders of the Board shall be the record of such proceedings. The Board shall furnish a transcript of such record at cost to any person interested in such hearing.

(d) If, after completion of the hearing, the Board shall be of the opinion that the accused is guilty of the charges, or any of them, the Board shall issue an order refusing, suspending, or revoking the certificate. Such order shall be served upon the accused person either personally or by mailing it by registered mail to the address specified by the accused person in his last notification to the Board.

(e) Any person aggrieved by the action of the Board, in refusing, suspending, or revoking a registration or certification or by any other action of the Board, which is alleged to be improper, unreasonable, or unlawful may appeal from such action of the Board to the United States District Court for the District of Columbia.

(f) Appeals from suspension or revocation of registration and certification must be taken within thirty days after such refusal, suspension, or revocation. In the case of appeals from other actions of the Board, the appeal may be taken at any time by the person aggrieved by such action. No such action shall act as supersedeas unless specially allowed by the court.

(g) Proceedings shall be conducted according to the Rules of Civil Procedure for the United States District Courts and the appeal shall be heard by the judge or judges of the court without a jury. The court shall affirm the decision of the Board, unless it shall find the same is in violation of the constitutional rights of the appellant, or is not in accordance with law, or was made upon unlawful procedure, or that any finding of fact made by the Board and necessary to support its adjudication is not supported by substantial evidence. If the adjudication of the Board is not affirmed the court may set aside or modify it in whole or in part, or may remand the proceeding to the Board for further disposition in accordance with the order of the court.

(h) Either party may appeal from the decision of the United States District Court for the District of Columbia to the United States Court of Appeals for the District of Columbia circuit. Any appeal on behalf of the Board may be filed without bond. The decree of the United States Court of Appeals shall be final and conclusive.

**SEC. 10. EXEMPTIONS.**—Nothing in this Act shall be construed to affect or prevent the following:

(a) The practice of engineering by any person who, within one year after the enactment of this Act, has filed with the Board an application for registration under this Act. This exemption shall continue only for such time as the Board may require for consideration of said application.

(b) The practice of engineering for not exceeding thirty days in the aggregate in one calendar year by a nonresident not having a place of business in the District of Columbia, if such person is licensed or registered to engage in the practice of engineering in a State or Territory in which the requirements and qualifications for obtaining a license or registration are reasonably equivalent to those specified in this Act.

(c) The practice of engineering for more than thirty days by a nonresident not having a place of business in the District of Columbia, or by a person who has recently become a resident of or has recently entered the practice of engineering in the District of Columbia, and who has filed with the Board an application for registration, if such person is registered or licensed to engage in the practice of engineering in a State or Territory in which the requirements and qualifications for obtaining a license or registration are reasonably equivalent to those specified in this Act. Such practice shall be permitted only for such time as the Board requires for the consideration of the application.

(d) The performance of engineering work by any person who acts under the supervision of a professional engineer, or by an employee of a person lawfully engaged in the practice of engineering, and who, in either event, does not assume responsible charge of design or supervision.

(e) The practice of engineering as a consultant, officer, or employee of the Government of the United States or the government of the District of Columbia while engaged solely in such practice for said governments.

(f) The practice of any other legally recognized profession.

(g) The practice of engineering exclusively as an officer or employee of a public-utility corporation (Act Mar. 4, 1914, 37 Stat. 974, ch. 150, sec. 8, paragraph 1) by rendering to such corporation such service in connection with its facilities and property which are subject to supervision with respect to safety and security thereof by the Public Utilities Commission of the District of Columbia and so long as such person is thus actually and exclusively employed and no longer; *Provided, however*, That each such public-utility corporation shall employ at least one registered professional engineer who shall be in responsible charge of such engineering work.

(h) The practice of architecture by a person authorized to use the title of architect or registered architect under the provisions of the Architect's Registration Act, approved December 13, 1924, and as amended, and his doing such engineering work as is incidental to his architectural work.

(i) The construction or alteration of a building that does not cover over one thousand square feet of ground area and does not have a height of over twenty feet to the uppermost ceiling, or two habitable floors above a basement.

(j) The execution of construction work as a contractor, or the superintendence of such construction work as a foreman or superintendent, or the work performed as a salesman of engineering equipment or apparatus.

(k) The operation or maintenance of boilers, machinery or equipment when the operators are duly licensed under the provisions of the Act of Congress entitled "An Act to regulate steam engineers in the District of Columbia", approved February 28, 1887, as amended.

(l) The usual supervision of construction or installation of equipment within a plant under his immediate supervision by a person ordinarily designated as supervising engineer or chief engineer of power.

**SEC. 11. SEAL OF REGISTRANTS.**—(a) Each person registered under this Act may obtain a seal of a design authorized by the Board which shall bear the registrant's name and registration number, the legend "Registered Professional Engineer", and such other words or figures as the Board may deem necessary. Such seal, or a facsimile imprint of same, shall be stamped on all plans, specifications, and reports by the registrant responsible for the accuracy and adequacy of such plans, specifications, and reports, when filed with public authorities.

(b) It shall be unlawful for a registered engineer to affix or permit his seal to be affixed to any plans, specifications, or drawings for which he does not assume full responsibility for the adequacy and accuracy thereof.

(c) It shall be unlawful for any person to use such seal during the period the registration of the holder thereof is expired, suspended, or revoked, or to use a seal of any design not approved by the Board.

**SEC. 12. DISPLAY OF CERTIFICATE OF REGISTRATION.**—Whoever engages in the practice of engineering shall keep displayed in a conspicuous place in his established place of business the certificate of registration granted him under this Act, and evidence of current renewal.

**SEC. 13. FEES; PAYMENT OF EXPENSES; AUDIT.**—Each application for registration as a professional engineer shall be accompanied by the appropriate prescribed application fee and the registration fee. A person desiring certification as an engineer-in-

training shall pay the prescribed application fee for such certification with his application and shall pay the additional application fee and the registration fee upon filing his application for registration as a professional engineer.

Should the Board deny the issuance of a certificate of registration to any applicant, the registration fee deposited with the application shall be refunded.

The amount of the fees prescribed in this Act is that fixed by the following schedule:

(a) The application fee for professional engineer with first and second-stage examination is \$20.

(b) The application fee for professional engineer without examination is \$10.

(c) The application fee for engineer-in-training with examination is \$7.50.

(d) The application fee for engineer-in-training without examination is \$5.

(e) The application fee for professional engineer with second-stage examination is \$12.50.

(f) The fee for reexamination shall be determined by the Board not to exceed \$10.

(g) The registration fee for professional engineer is \$5.

(h) The biennial registration renewal fee for professional engineer is \$2.

(i) The fee for reissuance of a revoked certificate of engineer-in-training is \$7.50.

(j) The fee for reissuance of a revoked registration certificate is \$20.

(k) The fee for issuance of a duplicate certificate of registration is \$5.

(l) The penalty for delinquency is \$1 for each month after the date upon which the biennial renewal fee became due: *Provided, however*, That the total shall not exceed \$4.

The secretary-treasurer of the Board shall receive and account for all money derived from the provisions of this Act and shall keep such money in a separate fund to be known as "Professional engineers' fund", such fund to be disbursed only by the secretary-treasurer, upon itemized vouchers by the Chairman and attested by the secretary-treasurer of the Board. The secretary-treasurer shall furnish bond for the faithful discharge of his duties, in such form and amount as the Commissioners shall require. The premium on such bond shall be regarded as a proper and necessary expense of the Board. The secretary-treasurer of the Board shall receive such salary as the Commissioners shall determine, in addition to the compensation provided for in section 6. The Board may make expenditures from this fund for any purpose which, in the opinion of the Board, is reasonably necessary for the proper performance of its duties under this Act: *Provided, however*, That such expenditures shall in no event exceed the total of receipts. It shall be the duty of the Auditor of the District of Columbia to audit annually the accounts of the Board and make a report thereof to the Commissioners. For the purpose of performance of such duty the Auditor shall have free access to the books of account, records, and papers of the Board.

**SEC. 14. PENALTIES.**—Whoever shall engage or offer to engage in the practice of engineering without being registered, or exempted, as provided in this Act, or by verbal claim, sign, letterhead, card, or in any other way represent himself to be a professional engineer or through the use of any title including the word "engineer" or words of like import, or any other title, imply that he is a professional engineer without being registered as provided in this Act, or shall present or attempt to use as his own the registration certificate of another, or shall give any false or forged evidence of any kind to the Board, or to any member thereof, in order to obtain registration as a professional engineer, or shall use any suspended or revoked registration, or shall otherwise violate the laws relating to the practice of engineering shall be guilty of a misdemeanor and shall be punishable by a fine of not more than \$500 or imprisonment for not more than one year, or both.

**SEC. 15. PROSECUTIONS.**—(a) All violations of laws relating to the practice of engineering in the District of Columbia shall be prosecuted in the municipal court for the District of Columbia by the corporation counsel. The corporation counsel shall render such other legal services as may from time to time be required by the Board.

(b) The Superintendent of the Metropolitan Police Department shall detail such members of his force as may be necessary to assist the Board in the investigations and prosecutions incident to the enforcement of this Act.

(c) The corporation counsel is hereby authorized to apply for relief by injunction to restrain a person from the commission of any act which is prohibited by this Act. In such proceedings it shall not be necessary for the corporation counsel to allege or prove either that an adequate remedy at law does not exist, or that substantial and irreparable damage would result, from the continued violation thereof.

**SEC. 16. ANNUAL REPORT.**—The Board shall submit an annual report to the Commissioners on the first Monday in August, containing a statement of moneys received and disbursed and a summary of its official acts during the next preceding fiscal year, and recommendations for such further legislation relating to the practice of engineering as may be necessary in the public interest.

**SEC. 17. SAVING CLAUSE.**—If any section or sections, clause or clauses, of this Act, or any regulations promulgated thereunder, be declared unconstitutional or invalid, that shall not invalidate any other sections or clauses of this Act, or any other regulations promulgated thereunder.

**SEC. 18. REPEAL OF CONFLICTING LEGISLATION.**—All laws or parts of laws and regulations promulgated thereunder in conflict with the provisions of this Act shall be, and the same are hereby, repealed.

**SEC. 19.** This Act shall take effect upon the expiration of the ninetieth day after the date of its enactment.

Approved September 19, 1950.

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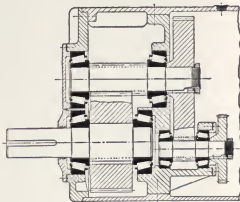
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